

What is claimed is:

1. A method for labeling a membrane-localized protein in a cell comprising introducing a biotin target sequence tag into
5 at least one loop domain of a membrane-localized protein and exposing said tagged protein to a biotin ligase in the presence of biotin so that the membrane localized protein is labeled.
- 10 2. The method of claim 1, wherein the membrane-localized protein is an ion channel.
3. The method of claim 2, wherein the membrane-localized protein is cystic fibrosis transmembrane conductance
15 regulator.
4. The method of claim 3, wherein the cystic fibrosis transmembrane conductance regulator has a defect in membrane
20 localization.
5. An isolated recombinant cystic fibrosis transmembrane conductance regulator protein comprising a biotin target
sequence tag introduced into an extracellular loop of the cystic fibrosis transmembrane conductance regulator protein
25 encoded by a nucleic acid sequence of SEQ ID NO:1.
6. The recombinant protein of claim 5, wherein the extracellular loop is loop four of the cystic fibrosis
transmembrane conductance regulator protein encoded by a
30 nucleic acid sequence of SEQ ID NO:1.

7. A method for identifying an agent which corrects protein misfolding of a membrane-localized protein comprising

obtaining a cell which expresses a misfolded membrane-
5 localized protein, wherein said protein is tagged with a biotin target sequence;

contacting the cell with a test agent and a biotin ligase in the presence of biotin so that the biotin target sequence tag of the protein is labeled; and

10 detecting the presence of labeled protein in cells contacted with the test agent, wherein the presence of labeled protein indicates the agent corrects protein misfolding of a membrane-localized protein.

15 8. The method of claim 7, further comprising the step of contacting the cell with a permeabilizing agent before the step of detecting the presence of the labeled protein.